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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/522,051	IMELAINEN, KEIJO	
	Examiner	Art Unit	
	DENNIS CORDRAY	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-9 and 13-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-9 and 13-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The rejections of claims under 35 U.S.C. 112, 2nd paragraph have been withdrawn. However, due to the amendments, new grounds of rejection are made under 35 U.S.C. 112, 2nd paragraph as detailed below.

2. In addition, due to the amendments to Claims 1, 9 and 19 and in consideration of Applicant's arguments concerning the intended meaning of the amended limitation, "substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler," a previously made rejection under 35 U.S.C. 112, 1st paragraph is reinstated.

3. Applicant's amendments filed 12/19/2008 have failed to overcome the outstanding rejections over the cited prior art. Applicant's arguments have been fully considered but they are not persuasive.

Applicant argues that Saviharju, Kuusio, Rundstrom, Shaw, Tomlinson II and combinations thereof fail to teach or suggest that dried bark is gasified to produce fuel gas that is fed into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler. The words, "substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler," are referenced numerous times throughout the remarks in reference to the deficiencies of the cited prior art. On p 15, lines 6-9 Applicant argues that the intended meaning is "substantially continuous or uninterrupted burning of the

fuel gas during the *entire* time that the concentrated liquor is burned." Applicant is arguing unclaimed features.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

As discussed in the outstanding rejections, the cited prior art (Shaw et al and Tomlinson II) discloses supplying auxiliary fuel, such as gas, to initiate combustion on startup of the soda recovery boiler, to increase production of steam to meet demands exceeding that produced by combustion of the black liquor alone, and to maintain operating temperatures throughout the furnace in recovery boilers over a range of production rates. To accomplish these needs, the gas would necessarily need to be supplied and burned substantially continuously for at least some period(s) of time during the time in which the concentrated liquor is burned in the soda recovery boiler.

Saviharju et al and Kuusio teach that corrosion problems and other process limitations exist in conventional pulp mill processes in which bark is burned in a bark boiler and black liquor in a recovery boiler to produce superheated steam. Saviharju et al and Kuusio disclose solutions to the problems by gasifying the bark or a portion of the black liquor to produce clean combustible gas that is used to increase the temperature of superheated steam in a superheating boiler and also to reduce corrosion. The references teach that the combustible gas can be used as a fuel to replace purchased

or fossil fuels in a lime burning kiln and for production needs in a soda recovery or superheating boiler. Kuusio also teaches that the gas can be used as a starting fuel in a waste liquor recovery boiler. As discussed above, Shaw et al and Tomlinson II teach that auxiliary fuel gas is used in the soda recovery boiler for several purposes. Why would it not have been obvious to one of ordinary skill in the art to also use the clean combustible gas from gasifying wood, which has been disclosed as usable in the same manner as gas from gasifying the waste liquor, as an auxiliary fuel gas is in the soda recovery boiler as well?

Kuusio (see p 15 of the remarks) does not teach against using bark for fuel, but reducing the need for auxiliary fuels, such as mineral oil, natural gas or wood waste in the superheating boiler. In addition, from the conventional processes, one of ordinary skill in the art would realize that the wood waste mentioned by Kuusio is wood or bark that would be burned in a boiler such as a bark boiler.

Regarding Shaw (see pp 15-16), the cited lines recite that the auxiliary fuel can be gas or other fuel, such as fuel oil, not that auxiliary gas is fuel oil. The gas is fed into a chemical recovery boiler burning black liquor during startup of the boiler (col 2, lines 68-75 and col 3, lines 42-51). One of ordinary skill would realize that the gas is fed substantially continuously during at least part of the time in which the black liquor is burned. Why would it not have been obvious to use a fuel gas from any available source, especially obtained from on-site generation to save purchasing the gas?

Regarding Tomlinson II (see pp 16-17), the reference teaches that, in addition to any other lignocellulosic fuels (e.g.-particulate solid fuel, sawdust), gas is used as an

auxiliary to maintain satisfactory operating temperatures throughout the furnace over a considerable range of production rates. One of ordinary skill would realize that the gas is fed substantially continuously during at least part of the time in which the black liquor is burned. Why would it not have been obvious to use a fuel gas from any available source, especially obtained from on-site generation to save purchasing the gas?

Regarding the arguments on pp 19-25 that the prior art fails to teach an outlet means from a dried bark gasifier connected to a feed unit of the recovery boiler to substantially continuously feed fuel gas. Saviharju et al teaches that gas generated in a gasifier is fed to the superheating boiler. Kuusio teaches using gas from gasifying black liquor as a starting fuel for the soda recovery boiler and as a fuel for the superheating boiler. The obviousness of using gas from a bark gasifier in the soda recovery boiler has been established. The plumbing required to supply gas from the outlet of the gasifier to the feed unit of the soda recovery boiler would also have been obvious.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. The following rejection is reinstated from a prior Office Action due to the amendments to Claims 1, 9 and 19 and in consideration of Applicant's arguments concerning the intended meaning of the limitation in amended Claims 1 and 9 of "substantially continuously during the time in which the concentrated liquor is burned in

the soda recovery boiler," and in Claim 19 of "to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler."

5. Claims 1, 9 and 19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1, 9 recite that the fuel gas is fed into the soda recovery boiler "substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler."

Claim 19 recites an "outlet means of the gasifier being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler."

Applicant has argued on p 15, lines 6-9 of the remarks submitted on 12/19/2008 that the above limitations are intended to mean "substantially continuous or uninterrupted burning of the fuel gas during the *entire* time that the concentrated liquor is burned."

The instant Specification as filed discusses using the fuel gas produced from gasifying waste bark in the soda recovery boiler. For examples, the Specification recites:

On p 5, par 16 that "a substantial portion of the fuel gas is burned to produce additional heat in the recovery boiler,"

On p 6, par 17 that "The fuel gas produced by the process according to the invention can be used for raising the values of the superheated steam produced by the recovery boiler,"

On p 6, par 17 that "It is also possible to carry out the superheating of the produced steam in its entirety by using the flue gases produced in the separate burning of fuel gas,"

On p 6, par 18 that "a biogenic fuel is gasified and burned in direct contact with the burning of concentrated liquor,"

On p 9, par 30 that "The greatest improvement is obtained when the heavy fuel oil of the lime sludge reburning kiln is replaced in accordance with the process with fuel gas (approx. 45%) and the remainder is burned in the soda recovery boiler (approx. 55%),"

On p 9, par 31 that "approximately 55% of the above-mentioned gas is directed to the soda recovery boiler for burning,"

On p 10, par 36 that "The gas is directed to the recovery unit for the chemicals from pulp cooking, where it is burned together with the concentrated liquor obtained from the waste liquor from digestion,"

On p 16, par 60 that " At least a portion of the gas, preferably at least 10% (of the gas volume), most suitably at least 40%, especially preferably at least 50%, is fed into the soda recovery boiler 7,"

On p 18, par 67 that "A substantial proportion of the fuel gases, most suitably at least 55% by volume, are directed to the soda recovery boiler,"

On p 18, par 68 that "The gas obtained from the gasification 14 can be used not only as a fuel gas for the soda recovery boiler," and in several other paragraphs.

The Specification does not disclose "substantially continuous or uninterrupted burning of the fuel gas during the *entire* time that the concentrated liquor is burned." No actual working examples are provided. A general discussion is given of potential benefits of the invention based on burning approximately 55% of the fuel gas produced by gasifying bark in the soda recovery boiler (p 9, pars 30 and 31), but the discussion does not convey to one of ordinary skill in the art the argued meaning of the limitation.

One of ordinary skill in the art would read the Specification in the light of the known state of the art. In the state of the art disclosed in the cited prior art, auxiliary gas is supplied to the soda recovery boiler at startup, where additional steam demands need to be met and to maintain operating temperatures throughout the furnace over a range of production rates. Applicant admits in the remarks (p 16, lines 2-7) that Shaw teaches that the auxiliary fuel is turned off after startup. Why would one of ordinary skill in the art construe the discussion in the instant Specification as teaching "substantially continuous or uninterrupted burning of the fuel gas during the *entire* time that the concentrated liquor is burned," rather than just replacement of purchased or fossil fuels used at conventional locations and times (e.g.-at startup and as needed for temperature control and production needs) in the soda recovery boiler?

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 33 and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 33 and 39 recite the limitation "the exit gases from the drying of the bark". Claim 33 and 39 depend from Claims 32 and 38 respectively. Claim 32 recites "waste heat from flue gas of the soda recovery boiler is used for drying the bark." The claims do not make it clear if the flue gas is used to dry the wood through direct contact or by some other means, thus it is not clear if the claimed exit gases are flue gases of the soda recovery boiler or some other gas used in or generated from drying.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-4, 9, 13, 14, 17, 18, 32-36, 38-40 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saviharju et al (2004/0011484) in view of Kuusio et al (WO 93/11297) and Rundstrom (5226927) and further in view of Shaw et al (3607117) and Tomlinson II (4312702).

Claims 1, 3, 9, 13, 34 and 40: Saviharju et al teach that, in chemical pulp mills, wood bark is removed from logs (debarking process), the wood logs are cut into chips and chemically processed (cooked or digested) to separate the fibers. The cooking chemicals are recovered from the waste alkaline cooking liquor, or black liquor, by firing the black liquor in a recovery boiler. Energy released in the recovery boiler is recovered as pressurized or superheated steam and used to produce electric power and low-pressure steam for other mill heating needs (p 1, pars 2 and 4). Saviharju et al also teaches that gasification of wood and bark in fluidized bed gasifiers has been in commercial use since 1983 in pulp mills for producing combustible gas for use on lime reburning kilns (p 1, par 7).

Saviharju et al discloses a modified process for producing energy at a pulp mill comprising (Abs; p 1, par 9):

- burning black liquor (cellulose pulp digestion liquor) from kraft pulping (i.e.-a sulfate pulp mill) in a recovery boiler and
- recovering heat from the flue gases produced in the form of saturated and partially superheated steam,
- gasifying wood bark or wood wastes to generate a combustible gas (fuel gas),
- burning at least part of the combustible gas in a superheating boiler superheat the saturated and partially superheated steam in the superheating boiler.

In some embodiments, a combustible gas fuel is produced by gasifying bark, then purified in a purification unit by removing the alkali components (ash) (p 1, par 10; pp 2-3, par 23). Saviharju et al discloses that the bark is dried before gasification to

produce more combustible components (p 2, pars 20 and 21). All or some of the bark produced in the pulp mill can be used (p 2, par 16).

Saviharju et al does not specifically recite digesting the wood material in a cooking liquor to separate the fibers, extracting the digested material as black liquor, or recovering the cooking chemicals from a soda recovery boiler, but the processes are taught as typical processes in a chemical pulp mill (p 1, par 2) and would have been obvious to one of ordinary skill in the art. Saviharju et al also does not disclose that the bark is produced in a debarking process at the mill; however, obtaining bark from a debarking process at the mill would have been obvious to one of ordinary skill in the art as a convenient and inexpensive source of bark that needs to be disposed of.

Saviharju et al does not disclose that the black liquor is concentrated by evaporation prior to being burned, that bark is dried to a moisture content below 30% prior to gasification, or that the combustible gas obtained from the bark is burned in the recovery boiler.

Kuusio et al disclose a method of recovering energy from waste liquors from pulp processes by burning the waste liquor in a soda recovery boiler, recovering chemicals and recovering energy in the form of superheated steam (Abs; p 1, lines 6-12; p 5, lines 19-26; p 8, lines 32-35). Energy is also recovered as electrical energy (p 13, lines 33-35). The waste liquor is concentrated by evaporation to a dry solids content of about 80% (moisture content about 20%) before being sprayed into the recovery boiler (p 12, lines 29-34). A portion of the waste liquor is gasified to produce gas as a replacement for fossil fuels to supply a separate superheating boiler for superheating the steam

produced in the recovery boiler (p 6, lines 1-22). Waste liquor is concentrated prior to gasification to a dry solids content of up to 85% (15% moisture) to create a relatively good fuel and improve the energy economy of the gasifier and the soda recovery boiler (p 7, lines 15-31). The produced gas is conveyed through a purification unit and, after purification, can be used as starting fuel in the recovery boiler to replace purchased fuel, and as fuel in a lime mud reburning kiln (p 10, line 37 to p 11, line 1; p 13, lines 19-24).

Rundstrom discloses a wood gasifier for continuously converting wood waste into relatively tar free fuel gas without release of large quantities of air pollutants (Abs; col 2, lines 36-48). Drying the waste material to < 20% moisture content is preferable for continuous operation (col 8, lines 43-49). Grinding the wood pieces to sizes between about ½" to 8" is preferable for continuous operation (col 8, lines 25-30).

Saviharju et al, Kuusio et al and Rundstrom do not explicitly disclose continuously supplying or burning the fuel gas in the recovery boiler.

Shaw et al teaches that, under normal conditions, auxiliary fuel (gas is mentioned) is supplied when the boiler is started up to initiate combustion of the black liquor, then subsequently shut off leaving the black liquor as the only fuel supplied to the boiler (col 3, lines 42-50). Shaw et al also teaches that auxiliary gas is supplied during operation of the recovery boiler to increase the production of steam to meet steam demands exceeding that produced by combustion of black liquor alone (col 3, lines 54-60). As a starting fuel or an auxiliary gas to increase the production of steam in the recovery boiler, a fuel gas is fed substantially continuously into the recovery boiler for at least a portion of the time in which the concentrated liquor is burned or, at least,

continuous feeding and burning would have been obvious to one of ordinary skill in the art.

Tomlinson II teaches that auxiliary fuel, such as oil or gas, is used to maintain operating temperatures throughout the furnace in recovery boilers over a considerable range of production rates (col 6, lines 10-16), thus a fuel gas is fed substantially continuously into the recovery boiler for at least a portion of the time in which the concentrated liquor is burned.

The art of Saviharju et al, Kuusio et al, Rundstrom, Shaw et al, Tomlinson II and the instant invention is analogous as pertaining to treatment of waste liquor and waste wood material and bark in a pulp mill. The use of auxiliary fuels is known in recovery boilers, both during startup and during continuous operation. Kuusio et al, Shaw et al and Tomlinson II teach the usage of auxiliary fuel gas in the waste liquor recovery boiler. Kuusio et al teach fuel gas obtained from gasified waste material (waste liquor) used as a starting fuel in the waste liquor recovery boiler and for other fuel gas needs in the mill. Saviharju et al teaches gasification of waste bark to provide auxiliary fuel gas for various fuel gas needs in the mill. It would have been obvious to one of ordinary skill in the art to use a portion of the gas generated by gasification of wood bark for any apparatus requiring auxiliary fuel, including the recovery boiler, in the process of Saviharju et al in view of Kuusio et al and Rundstrom and further in view of Shaw et al and Tomlinson II to save on the cost of purchased fossil fuel and minimize waste bark disposal. One of ordinary skill in the art would have been able to determine the periods of need for auxiliary fuel in the recovery boiler during the time in which the concentrated

liquor is burned and to supply and burn the fuel substantially continuously during those periods at startup, to meet steam generation demands and to maintain temperature control in the furnace. It would further have been obvious to concentrate the black liquor and the wood bark to the claimed moisture content to provide fuel and improve energy economy for the recovery boiler and other heating equipment.

Claims 2, 36 and 42: of Saviharju et al, Kuusio et al and Rundstrom do not disclose the amount of generated gas used in the recovery boiler. However, the amount of fuel gas used in a combustion process is a result effective variable and it would have been within the capability of one of ordinary skill in the art to optimize the percentages of the fuel gas required for operation of the recovery boiler, superheater and lime reburning kiln or, alternatively, to use all of the gasified fuel gas if required in the recovery boiler.

Claims 4 and 17: Saviharju et al disclose that a portion of the generated gas is used to superheat soda recovery boiler steam in a superheating boiler that is separate from the recovery boiler (superheating chamber separate from the flue gases of the soda recovery boiler) (p 1, par 9; p 3, par 18; Fig. 1, items 14 and 18). Figure 1 of Saviharju et al shows schematically (p 2, pars 18-22) a combination soda recovery boiler and steam superheating unit divided, in the upper portion thereof in the direction of flow of the flue gases, into two chambers, the right hand chamber (15) for burning concentrated waste liquor, vaporizing boiler waters and heating the steam therefrom (via surfaces 34, 36 and 40), and the left hand chamber separated from the flue gases of the right chamber (18) for superheating the steam. Gasified fuel is burned in the

superheating chamber by burner (56). As discussed above, it would also have been obvious to also burn fuel from the gasifier in the recovery boiler (right hand chamber).

Claims 14: Saviharju et al disclose that the wood material can be dried by flue gases from the recovery boiler (p 2, par 20). While not explicitly disclosed, bringing the flue gas into direct contact with the waste wood would have been obvious to one of ordinary skill in the art as an efficient drying method.

Claims 18 and 35: Saviharju et al disclose that a portion of the combustible gas can be used to fuel a lime kiln to replace fossil fuels (p 2, pars 12 and 21).

Claims 32 and 38: Saviharju et al disclose that the bark can be dried using flue gases from the recovery boiler or the lime burning kiln (p 2, par 20).

Claims 33 and 39: Saviharju et al do not explicitly disclose that flue gases, after being used to dry the bark, are recombined with the flue gases from the soda recovery boiler. However, it would have also been obvious to one of ordinary skill in the art to recombine gas from the drying of the bark with that from the soda recovery boiler to simultaneously recover any remaining energy therefrom in a single unit rather than requiring a separate heat recovery unit.

8. Claims 6-8, 14-15, 19-31 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saviharju et al in view of Kuusio et al and Rundstrom and further in view of Shaw et al and Tomlinson II, as applied to Claims 1-4, 9, 13, 14, 17, 18, 32-36, 38-40 and 42 above, and even further in view of O'Hagan et al (4627173).

Saviharju et al, Kuusio et al, Rundstrom, Shaw et al and Tomlinson II are used as above. Saviharju et al, Kuusio et al, Rundstrom, Shaw et al and Tomlinson II do not disclose the configuration of the dryer, its connection to the gasifier, the temperatures of the gases used in the dryer, the use of steam or warm water, or connecting the outlet of the gasifier to the recovery boiler.

Saviharju et al disclose that dried wood fuel, such as bark, from the mill is supplied as a feed (feed means) to a gasifier (Fig 1, items 12 and 10; p 2, pars 18-21). The wood can be dried using flue gases, therefore, a bark drying unit adapted to use waste heat from the mill for drying is implicitly disclosed or, at least, would have been obvious to one of ordinary skill in the art. A feed means for wood bark and outlet means for dried bark in the drying unit would similarly have been obvious, as would connecting the outlet means to the feed means for the gasifier. Saviharju et al also disclose a purifier (to separate impurities) attached to the gas outlet of the gasifier and a gas outlet from the purifier connected to a superheating boiler and to a lime kiln (Fig 1, items 44 and 46). Since using the gas substantially continuously from the gasifier in the soda recovery boiler would also have been obvious, as discussed above, connecting the gas outlet of the gasifier to a feed means of the recovery boiler for substantially continuously supplying fuel gas would also have been obvious.

Kuusio et al disclose an example of a soda recovery boiler and two soda recovery boiler-superheating boiler combinations in a pulp mill. The bled steam pressure is 12 bars and that of the low pressure steam is 4.5 bars, which the Examiner

construes as being typical steam pressures for bled steam and back pressure steam available in a pulp mill (p 14, line 34 to p 15, line 5).

O'Hagan et al disclose a fluidized bed dryer (ebulliating) for particulate wet wood material or waste (i.e.-bark, wood chips, forest residues) using flue gases typically having a temperature of 400-600°F (204-315°C), and that the flue gases are cooled in the dryer to 160-250°F (71-121°C), which lies within the claimed ranges (Abs, col 1, lines 13-17; col. 6, lines 34-50; col 7, lines 36-38). Overheating of the wood is to be avoided (col 6, lines 17-18). O'Hagan et al also disclose that typically hog fuel or wet wood waste is dried to a 10-30% moisture content (col 5, lines 57-61). O'Hagan et al disclose that either steam or flue gas from a combustion source can be used for fluidizing and drying (Abs; col 1,lines 55-59; col 5, line 57 to col 6, line 1; col 7, lines 36-38). Using the drying gas to fluidize the bed inherently involves direct contact of the gas with the solids. O'Hagan et al teaches that fluid or fluidized bed dryers are well known for the high rate of heat transfer between the gas and the fluidized particles as well as between bed particulates and surfaces immersed in the bed (col. 3, lines 18-21).

The art of Saviharju et al, Kuusio et al, Rundstrom, Shaw et al, Tomlinson II, O'Hagan et al and the instant invention is analogous as pertaining to drying and gasifying waste wood. It would have been obvious to a person of ordinary skill in the art to use a fluidized bed dryer as the drying apparatus in the process of Saviharju et al in view of Kuusio et al and further in view of O'Hagan et al to obtain a high rate of heat transfer and rapid drying of the bark. It would have further been obvious to one of ordinary skill in the art to obtain the claimed gas temperatures to avoid overheating the

wood. Saviharju et al discloses recovery of energy in the form of low pressure steam, which is available for other plant needs and Kuusio et al discloses low pressure steam and bled steam having pressures in the claimed range. It would have been obvious to one of ordinary skill in the art to use available low pressure or bled steam having the claimed pressure as a readily available source of energy for drying. It would also have been obvious to dry the wood waste to 10-30% as disclosed by O'Hagan to provide a suitable fuel for the gasification process.

Regarding Claims 20 and 23-25, although the cited references do not expressly disclose two separate dryers, duplication of parts has no patentable significance unless a new and unexpected result is produced (see MPEP 2144.04 VI B). There is no evidence in the instant Specification of unexpected results obtained by using two dryers in the process. It would have been obvious to make each dryer of the same type (i.e.- fluidized bed dryer) and connect one to the other.

Alternatively, the dryer of O'Hagan et al is constructed to provide a plurality of sequential drying zones (cascade fashion). The dried fines are removed from each zone before the partially dried coarser particles are transported to the next zone, thus providing a more consistent moisture content in both fine and coarse particles. The gas flow velocity in each zone is varied to provide the optimum amount of drying (col 4, line 50 to col 5, line 9; col 5, lines 26-56). It would have been obvious to one of ordinary skill in the art to provide the drying in separate dryers in the process of Saviharju et al in view of Kuusio et al and Rundstrom and further in view of O'Hagan et al as a functionally equivalent option. The number of dryers required would have been

determinable by one of ordinary skill in the art. It would have been obvious to make each dryer of the same type (i.e.-fluidized bed dryer). Providing a feed means for bark to be dried and an outlet means for dried bark would have been obvious. Connecting the outlet means for dried bark of one dryer to the feed unit of a following dryer in a cascade arrangement would also have been obvious.

Regarding Claims 21-22, Rundstrom discloses grinding the wood pieces to sizes between about ½" to 8" is preferable for continuous operation of the gasifier (col 8, lines 25-30). It would thus have been obvious to include a grinding step before or between two dryers with appropriate feed and outlet to obtain wood pieces of sizes between about ½" to 8" for continuous operation of the gasifier.

9. Claims 16 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saviharju et al in view of Kuusio et al and Rundstrom and further in view of Shaw et al, Tomlinson II, as applied to Claims 1 and 9 above, and even further in view of Labedev-Krassin (RU-2011940, Derwent Abstract enclosed) or Watchman (4644136).

Saviharju et al, Kuusio et al, Rundstrom, Shaw et al and Tomlinson II are used as above. Saviharju et al ,Kuusio et al, Rundstrom, Shaw et al and Tomlinson II do not disclose using warm water present at the pulp mill for drying the bark.

Labedev-Krassin discloses a dryer comprising drying chambers, the temperature of which is controlled by circulating warm water through heating/cooling coils in the chambers (Abs).

Watchman discloses a towel warmer that contacts the exposed surfaces of a towel with a continuous flow of warm air heated by hot water flowing through a conduit (Abs). Evaporation of any moisture in the towels (drying) would have been an obvious effect of the heating.

The art of Saviharju et al, Kuusio et al, Rundstrom, Shaw et al, Tomlinson II, Labedev-Krassin, Watchman and the instant invention is analogous as pertaining to heating and drying materials. It would have been obvious to a person of ordinary skill in the art to use warm water available at the mill to provide energy for drying the bark in the process of Saviharju et al in view of Kuusio et al and Rundstrom and further in view of Shaw et al, Tomlinson II and even further in view of Labedev-Krassin or Watchman as a readily available source of heat that minimizes the need for steam or heating fuels for the process.

10. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saviharju et al in view of Kuusio et al and Rundstrom and further in view of Shaw et al, Tomlinson II and O'Hagan et al, as applied to Claim 19 above, and even further in view of Labedev-Krassin (RU-2011940, Derwent Abstract enclosed) or Watchman (4644136).

The disclosures of Saviharju et al, Kuusio et al, Rundstrom, Shaw et al, Tomlinson II, O'Hagan, Labedev-Krassin and Watchman are used as above.

Saviharju et al ,Kuusio et al, Rundstrom, Shaw et al, Tomlinson II and O'Hagan do not disclose using warm water present at the pulp mill for drying the bark.

The art of Saviharju et al, Kuusio et al, Rundstrom, Shaw et al, Tomlinson II, O'Hagan, Labedev-Krassin, Watchman and the instant invention is analogous as pertaining to heating and drying materials. It would have been obvious to a person of ordinary skill in the art to use warm water available at the mill to provide energy for drying the bark in the process of Saviharju et al in view of Kuusio et al and Rundstrom and further in view of Shaw et al, Tomlinson II and O'Hagan et al and even further in view of Labedev-Krassin or Watchman as a readily available source of heat that minimizes the need for steam or heating fuels for the process.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS CORDRAY whose telephone number is (571)272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dennis Cordray/
Examiner, Art Unit 1791

/Eric Hug/
Primary Examiner, Art Unit 1791